

1 1. A metering pump, comprising:
2 an actuating mechanism, and
3 a plurality of piston cylinders arranged radially about the actuating mechanism and
4 coupled to the actuating mechanism, a first of the cylinders having a working volume that
5 differs from a second of the cylinders.

1 2. The metering pump of claim 1 further comprising a piston housed within the
2 first cylinder, and a piston housed within the second cylinder, the piston of the first cylinder
3 having a stroke that differs from the piston of the second cylinder.

1 3. The metering pump of claim 2 wherein the first cylinder is spaced from the
2 actuating mechanism a distance that differs from a spacing of the second cylinder from the
3 actuating mechanism.

1 4. The metering pump of claim 3 further comprising an adjustment mechanism
2 configured to vary the spacing of the cylinders from the actuating mechanism.

1 5. The metering pump of claim 4 wherein the cylinders are pivotably connected
2 to a housing and the adjustment mechanism comprises a screw and nut.

1 6. The metering pump of claim 1 wherein the first cylinder has a dimension
2 defining an inner volume that differs from a corresponding dimension of the second cylinder.

1 7. The metering pump of claim 6 wherein the dimension is an inner diameter of
2 the cylinder.

- 1 8. The metering pump of claim 1 comprising at least three cylinders
- 1 9. The metering pump of claim 8 wherein each cylinder has a working volume
2 that differs from the other cylinders.
- 1 10. The metering pump of claim 1 wherein the actuating mechanism comprises a
2 transition arm coupled to a stationary support and a rotary member.
- 1 11. The metering pump of claim 10 wherein the transition arm is coupled to the
2 stationary support by a U-joint.
- 1 12. The metering pump of claim 10 wherein the transition arm includes a plurality
2 of drive arms and a plurality of joints, each drive arm being coupling to one of the cylinders
3 by a respective joint.
- 1 13. The metering pump of claim 12 wherein the joint provides three degrees of
2 freedom.
- 1 14. The metering pump of claim 13 wherein the joint provides four degrees of
2 freedom.
- 1 15. The metering pump of claim 1 wherein the actuating mechanism is centrally
2 located.
- 1 16. A metering pump, comprising:
2 a centrally located actuating mechanism including a transition arm coupled to a
3 stationary support and a rotary member, and
4 a plurality of piston cylinders arranged radially about the actuating mechanism and
5 coupled to the actuating mechanism.

1 17. A method of metering fluids, comprising:
2 independently adjusting stroke of a plurality of pistons to adjust the volume of
3 metered fluid, each piston being housed within a cylinder having a fluid inlet and a metered
4 fluid outlet, and
5 selecting different cylinder diameters to adjust the volume of metered fluid.

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